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ABSTRACT

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Abstract

Managers having to account for costs of information activities is here to stay. Budgeting is going to become more stringent and imaginative. Costs should not be equated with human values--psychological and subjective--which apparently many managers do, feeling that having to cost information activities is degrading. Some trends are: Buy products and services rather than produce them or run them in your own group. Don't build an empire that you then have to find work for; stay flexible. Money available for scientific and technical activities is going to get less, at least in the federal government. Technical information activities and public information activities tend to merge as we move into crime, pollution, and race programs where getting lots of all kinds of information to all kinds of people and getting them to take action on it is important. Formation of a new special interest group in ASIS on costs, budgeting, and economics should initiate many necessary studies.

Costs and Budgeting

Many information managers grouse that the services and products they provide are difficult--if not impossible--to price. However, no mystique enshrouds the costing of information. It has its peculiarities, but you cost it by the same methods you cost any other service--safety, maintenance of building and grounds, or refuse disposal. (1) Cost in dollars is not to be equated to the subjective and psychological value of information for each individual researcher, anymore than for adequate medical insurance, a safer place to work, well-kept building and grounds, and not having the smell of garbage wafted through his window on spring mornings.

Programming, planning, and budgeting (PPB) is now required for most federal agencies, and will soon be required for all.

> "We urge the new administration to make every effort to strengthen the PPB System, increase the capability of the Bureau of the Budget and executive agencies to implement this system, and provide incentive for its effective functioning." (2)

PPB requires imagination as much as analysis. A price tag can, after all, be put on anything. That is not to say that human values have only the value of the price tag. There is nothing degrading--though many information managers seem to have the feeling that there is--about making the most of the dollars that came your way, or trying to get more to come to you, and giving values in dollars for what dollars buy.

Buy Services Rather than Build an Empire

The more that the information manager buys services, equipment, products, the better he will be able to know his costs and budget his own expenditures. Vendors are in business to sell for a profit; they know what their services and products costs and upon request will quote you firm prices.

Newer organizations such as the Department of Health, Education and Welfare; Housing and Urban Development; and Transportation, are buying--or should be buying--services rather than installing their own equipment, or hiring their own people--except as coordinators. These organizations should be farming out all possible information activities.

There is, for instance, no need to build your own stable of writers and editors. Particularly, with the current shortage of research and development funds, there are many qualified technical writers--many of them with Ph. D.'s in the sciences--who are willing to take on a writing chore, and whose agencies are glad to take in a little money to help support them. The Division of Technical Information of the U. S. Atomic Energy Commission, for example, has all of its series Understanding the Atom written under contract. Cost of individual books may seem high when you have to sign an order for payment, but if you look at how much it costs to support a writer for year and divide this by the number of books that he will produce, including of course all the overhead and fringe benefits, the cost is no more, maybe less, and you don't have to work up new programs simply to keep him occupied. You hire only a few higher level coordinators and reviewers who can see that the job gets done right.

No need, either, to develop your own computerized systems from scratch. In the first couple of post World War II decades, much of the development of computerized information systems was done by federal-government-sponsored organizations. Today, increasingly, the information manager can take advantage of commercial computer development. Not exactly off the shelf, but close to it. For example, McGraw-Hill recently signed an agreement with United Computing to store data from a number of its books and technical publications in the memory bank of United's computer in Kansas City. The computerized publication will be accessible to hundreds of users simultaneously through a multiplexed telephone circuit. To find a fact or formula instantly, an engineer simply dials a local telephone number and is connected directly to the United data center. The computer provides the answer immediately through an acoustic coupler and printer.

Does the information system have to have its own computer? Not necessarily. No more does it need its own microfilm camera, its own Copyflo or Xerox Mod IV. Services and products of most equipment are readily purchased these days. And what you can't buy today, you probably will be able to tomorrow. Information managers can help speed the process by shopping around, convincing vendors that if such and such services and products were available, not only would they buy them but so would many others.

Leveling Off of Federal Government Support

The trend to commercial availability and procurement of information services and products will be emphasized by the leveling off of support for information in the federal government, whether for research or operation. Growth of support for information has paralleled growth of research and development in the federal government, as data produced annually by the National Science Foundation shows (see Fig. 1). Funds for research and development are drying up, as is hardly a secret these days; so we may expect funds for information to run parallel. We may expect, as a matter of act, that scientific and technical information may be harder hit than research and development. Biggest chunk of federal money supporting information activities has come from the Department of Defense (see Fig. 2), and it is DOD that is very likely to be clobbered the hardest.

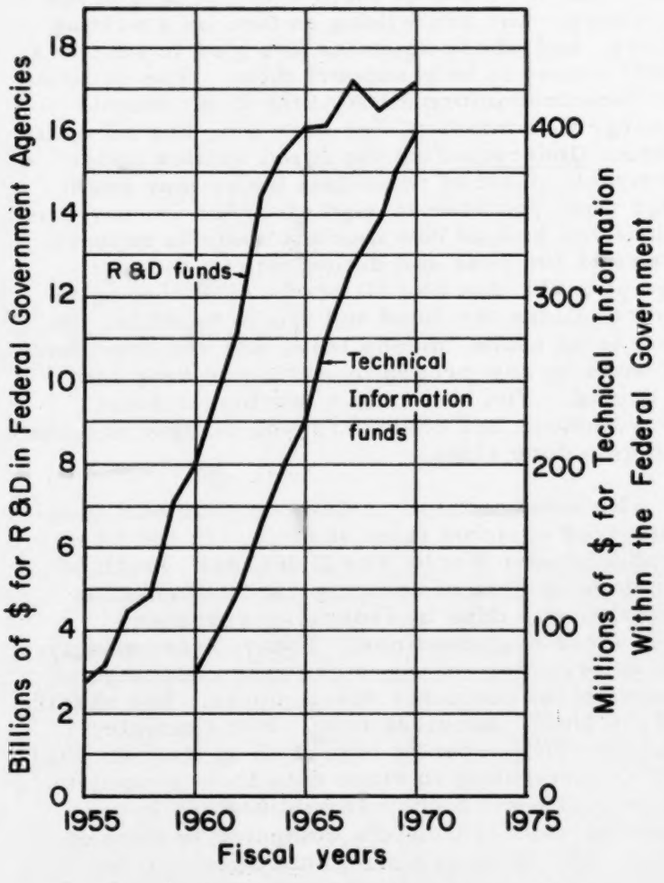
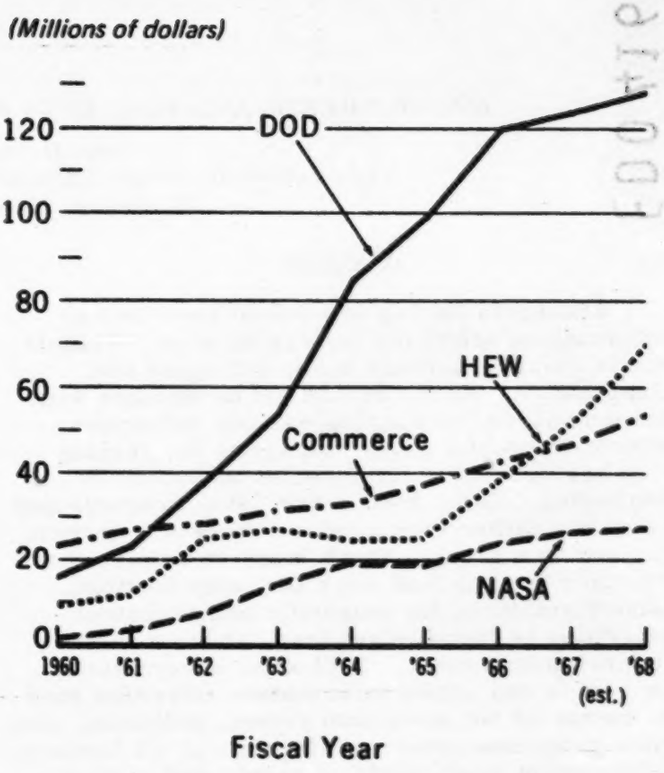


Figure 1. Growth in obligated funds for research and development activities and technical information activities in the federal government 1960 to 1970. Flattening of the information curve parallel to the research curve can be expected. (Sources: Bureau of the Budget and the National Science Foundation)



SOURCE: National Science Foundation

Figure 2. Trends in federal obligations for scientific and technical information, by selected agency.

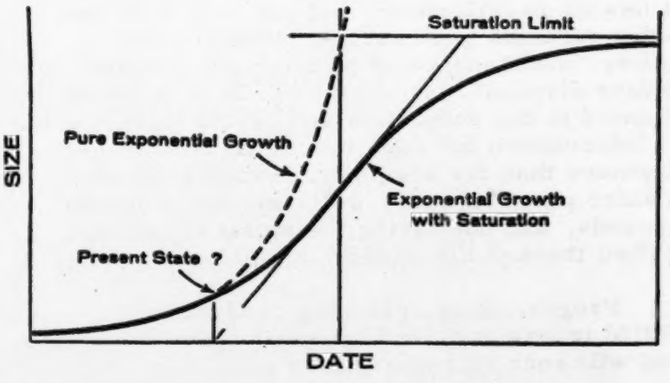


Figure 3. Exponential growth with saturation. Such growth is typical of automobile registration, number of scientists and television sets, and scientific and technical information activities. (From Science Since Babylon, by Derek John deSolla Price, Yale University Press, New Haven, Connecticut)

For at least two reasons we may expect the leveling off of support for information to continue for quite a while. First is the general law concerning social phenomena with exponential growth: after a while they reach saturation, and the exponential growth curve flattens out (see Fig. 3).

The information explosion is over: the roar dies away to a faint murmur, and the dust still hanging in the air results from those in the information business still trying to stir up a fuss.

Second reason for expecting information activities to remain flat for a while is that research and development in the sciences is going to remain flat for a while.

> Science does not have, and may not even warrant, a very high priority in the United States in [the] 1970[s] . . . In the competition for national resources, science is likely to be placed on the back burner by the nation for some years. (4)

All Media Are Go

Much time and breath is wasted among information people contending about which media, techniques, procedures, equipment will survive or dominate. They are all going to survive and the particular situation will dictate which will dominate. Television was going to do away with both movies and radio; but today both radio and movies are obviously with us to stay. Demise of hard copy has been prophesied year after year for the last couple of decades, but the tenacity of almost everybody in insisting on having hard copy seems to indicate that it too will survive. Cuneiform baked clay tablets and papryrus scrolls, are, unfortunately, no longer much used: throwing a cuneiform brick at one's opponent might be the best way to solve some endless arguments. And the hectograph, ditto, a fond purple memory of our youth, has all but disappeared. Fortunately, most of the packages we have devised for information still continue to be used: the more the better--we can't have too many ways in which to package our information and to communicate it.

What is the right mix? That is and will be the big question for the manager of information systems. And the right mix is increasingly going to be the mix with the right cost.

To what use can he put closed circuit television and video tape? Or should he substitute a documentary film for at least a part of the program? Computer-to-microfilm-made movies are available, but so is the slide show with or without sound track, where the speaker can go backwards and forwards with ease for one or several frames when discussion is underway. Books and brochures and reports and journal articles and trade magazines remain very informative. Read them, probably, in full size copy; but for storage go to reel microfilm or microfiche. Computerized storage and retrieval systems can even be economical for large searches and for selective dissemination of information systems; but for the detailed, tailored search, a good reference librarian or information expert is cheaper. So, happily, the reference librarian will be with us for the forseeable decades ahead.

Public Information and Technical Information Activities Merge

The difference can no longer be maintained between technical and nontechnical information. For instance, in the national campaign now being waged to clean up our air and water and keep them cleaned up, much of the highly technical material--chemistry and physics--have to make as much sense to the nonchemist and nonphysicist as they do the chemist and physicist and engineer. Not only do they have to make sense, they have to be understood well enough by the nonspecialist so that effective action can be taken. Reports on the analyses and constituents of polluted air and water will not only be published in technical reports, but will for example, be shown in documentary films, and will appear on television. And all of these packages will be used for instruction purposes in grade school, high school, and college, as well as for less structured information programs.

Informing, training, selling all merge. You not only want to tell a person a fact, you want to convince him to do something about it, and then show him how. Consequently, the trades of scientific and technical information (STINFO) specialist and public information (PI) man both have to shape their products for a multi-component audience, an audience which includes the audiences both have previously dealt with. All of the media become of equal interest to the technical information specialist/public information man.

What does this merger of STINFO-PI activities mean for costs? It means that public-information type of costs--those related to informing, training, and selling to the nontechnical audience--will increase relative to technical-information costs. Because the leveling off is not to be expected in the information required as we try to alleviate pollution, crime, and other social hazards of our time.

> "Generate your own list of the truly major problems of American society: terminating the war, search for a stable peace, implementation of a national and worldwide population policy, learning how to deal with political terrorism and the challenge to the legitimacy of government, achieving some progressive modus vivendi in our racial problems, understanding the real roots of youthful disaffection, including the startling drug usage, learning how to minimize the origins, understanding and coping with the increasing frequency of violence and criminal action, learning how to salvage the central city and upgrade the quality of urban life, alleviation of our biological and physical environmental problems, and development of an adequate system for the delivery of health care." (4)

Time Is Ripe for Improved Cost Analyses

A boon to the information manager, a reward of 25 years of effort in information and communication, is that he no longer has to strive to solve all the information and communication problems. All he is trying to do is to smooth the procedures, to eliminate any unnecessary impediments to communications. Information systems are not expected to solve "the information problem" or "the information explosion." Communication is a basic human process and all the information manager can hope to do is implement and improve the process.

With this tremendous weight lifted from his shoulders, the information manager can devote more of his attention to sophisticated cost analysis, both of the big chunks of his system and of its smaller components. He can do no better than follow the recommendations of the COMSAT report: (5)

STUDIES OF COST AND VALUE

Particularly important among the recommended studies will be those addressed to factors of cost and value. The difficulty of developing quantitative measures of the value of information services, as illustrated by the prevalence of such terms as "user satisfaction" or "document relevance to a request," suggests the need for greater ingenuity and more-systematic procedures in the conduct of such studies. Needed measures must include not only the value of different types of information but also the value of the time devoted to actively seeking information and of the waiting or lag time before it is received--that is, the "response time" of an information service. In situations in which a free market exists, the price the user is willing to pay for different information services provides a measure of such factors; however, this measure must be viewed with caution until the behavior of users, especially so-called "in a rut" behavior, is better understood. Collections of offhand opinions of scientists and technologists about the information services they think they want have little utility; often such opinions call for an exhaustive service when a less comprehensive but more reasonably priced one would be more valuable, or for an exceedingly fast service when a slower but cheaper one would be a better buy.

RECOMMENDATIONS

Develop measures of value for information services that embody various combinations of accuracy, completeness, discrimination, timeliness, and similar factors. Where appropriate, these studies should include experiments on user response to new services. The facility of providing additional specialized information services at appropriately scaled prices should receive particular attention.

Studies should be initiated to determine the relative costs of different methods of storage and transmission of recorded information.

Formation within ASIS of a special-interest group on costs, budgeting, and economics should help to get studies under way. *

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